# Five Year Strategic Plan (2012 – 2017) Raleigh Ecological Services Field Office U.S. Fish and Wildlife Service September 2012

#### **MISSION**

The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.

### **VISION STATEMENT**

The vision of the Raleigh Field Office is to collaboratively foster vibrant, healthy, abundant and self-sustaining Federal trust resources within the Piedmont, Sandhills, and Coastal Plain by promoting reasonable science-driven conservation. These Federal trust resources include: endangered and threatened species and at-risk species, migratory birds, migratory fish, National Wildlife Refuges, and the ecosystems on which they depend.

#### INTRODUCTION

The U.S. Fish and Wildlife Service (Service) has a strong presence in North Carolina, commensurate with the diversity and abundance of fish and wildlife resources in this great State. There are eleven National Wildlife Refuge units in the State, which comprise nearly half a million acres of fish and wildlife habitat and which provide exceptional opportunities for wildlife dependent recreation. Our Fish and Wildlife Coordination Office and Edenton National Fish Hatchery work to protect and restore fisheries in North Carolina's coastal waters and rivers. Our Migratory Bird Field Office provides biological assistance on habitat and population management for migratory birds. Our law enforcement officers enforce federal wildlife protection laws and international conventions and treaties. Additionally, our Ecological Services Field Offices in Asheville and Raleigh work with private and corporate landowners, local, state, and other federal agencies, and nongovernmental conservation organizations to protect National Wildlife Refuges, federally listed and at-risk, migratory birds and fish, and the ecosystems upon which they depend.

This 5-year Strategic Plan (Plan) for the Raleigh Ecological Services Field Office (RFO) is intended to guide and focus our work efforts on those activities where we can be most effective in fulfilling our mission and vision within the RFO work area (Figure 1). There are myriad challenges facing the fish and wildlife resources of North Carolina and there are countless activities in which we could engage to meet those challenges. This plan explicitly acknowledges that the RFO does not have the resources, authority, or expertise needed to do everything that we may wish; therefore our efforts must be focused in order to make the best use of our resources and capabilities. Some of our recognized priorities include longleaf pine restoration and red-

cockaded woodpecker recovery, fish passage in the Roanoke, Neuse, Cape Fear, and Yadkin-Pee Dee Rivers, recovery of endemic aquatic species (e.g., Cape Fear shiner, and Tar River spiny mussel) and terrestrial species (e.g., *Atrytonopsis* sp. 1, golden sedge), and protecting the environmental integrity of our National Wildlife Refuges.

We are fortunate in North Carolina to have a wealth of talented and committed partners in conservation. This plan is intended to focus our work efforts on those activities where we can provide the greatest benefit and best service to those partners and our customers, ultimately benefiting our trust resources. The RFO staff has expertise in federal natural resource laws, policies and programs, fish and wildlife toxicology, plant identification and morphology, fish passage, aquatic and terrestrial habitat restoration, aquatic ecology, red-cockaded woodpecker and longleaf pine habitat management, imperiled species recovery and management, and information technology. To our counterparts within the Service and the Department of the Interior, we pledge to use these capabilities to support, assist, and actively participate on the Eastern North Carolina/Southeastern Virginia (ENC/SEVA) Strategic Habitat Conservation Team and Savannah-Santee-Pee Dee (SSPD) Ecosystem Team, and to engage in those issues that are among our recognized shared priorities. To our external partners, we hope that this plan will help us clearly articulate our goals, priorities, and capabilities, and will help us identify opportunities and means to work together more effectively. Implicit in every objective and strategy identified in this plan is our commitment to work with, support, and be responsive to our conservation partners, particularly our state counterparts in the Wildlife Resources Commission and the Department of Environment and Natural Resources. We will also use our expertise and authority to be responsive to our customers' resource needs. We do all this in order to ensure the highest level of service possible for the American people.

The strategies highlighted in this plan reflect our assessment of the challenges facing North Carolina's fish and wildlife resources at the ecosystem level, an assessment of our capabilities to meet those challenges, and the capabilities and needs of our partners and customers. We have many mandates we must meet, but where we have discretion we will act in accordance with this plan to address high priority ecosystem concerns in ways that augment and support (rather than duplicate) the efforts of our partners.

Our emphasis on ecosystem level solutions leads naturally to a focus on collaborative, multiparty planning and problem solving. As such, many of the strategies in this Plan emphasize early involvement and communication with other agencies and organizations in their land use and project planning efforts. It is our intent to clearly identify and articulate fish and wildlife resource needs to local, state and federal planners and to work with them in a collaborative manner so that these needs can be fully integrated into their planning and project development.

We are a partner in many great collaborative conservation endeavors that are fundamental to our continued success in meeting our mission. These include landscape focused partnerships organized around key parts of our work area such as the <a href="Cape Fear Arch Conservation">Cape Fear Arch Conservation</a>
Collaborative, the <a href="Onslow Bight Conservation Forum">Onslow Bight Conservation Forum</a>, the <a href="North Carolina Sandhills">North Carolina Sandhills</a>
Conservation <a href="Partnership">Partnership</a>, the <a href="Greater Uwharrie Conservation Partnership</a>, and the Dan River Coalition. We are also involved in partnerships that cut across these landscapes such as the <a href="North Carolina Longleaf Coalition">North</a>

<u>Carolina Prescribed Fire Council</u>, the <u>North Carolina Interagency Leadership Team</u> and the Eastern North Carolina/Southeastern Virginia Strategic Habitat Conservation Team. We engage in these and other collaborative endeavors because they enable us to effectively and efficiently share knowledge and resources with partners that share mutual interests in our conservation priorities. Implicit in all the goals, objectives and strategies below is our continuing commitment to work within these and other collaborative efforts to address the challenges and opportunities identified in this plan.

This Plan is structured around our four primary trust resource responsibilities; endangered and threatened species, migratory birds, migratory fish, and National Wildlife Refuge lands. The structure of this plan further emphasizes that these resources are fundamental to our work and are central to our decision-making. Our role in conserving these resources is mandated under the authorities of the Endangered Species Act, Migratory Bird Treaty Act, Fish and Wildlife Coordination Act, and other laws, regulations, and Executive Orders (*see* <a href="http://laws.fws.gov/lawsdigest/indx.html">http://laws.fws.gov/lawsdigest/indx.html</a>). Our approach to identifying our conservation priorities, setting goals and objectives relative to those priorities and designing conservation actions to meet those goals is grounded in the Service's <a href="https://strategic Habitat Conservation">Strategic Habitat Conservation</a>
Framework.

In addition to identifying the federal trust resource priorities within the RFO work area, this plan is also designed to link those priorities to national-level priorities as identified in the Department of the Interior (DOI) Strategic Plan for Fiscal Years 2011 - 2016, the Service's Operational Plan, the priorities of the Service's Southeast Region and the South Atlantic Landscape Conservation Collaborative, the Service's Changing Climate Strategy and other national mandates such as the Government Performance and Results Act (GPRA). The intent is to clearly show how our activities contribute to meeting our locally defined goals and objectives as well as regional and national goals and GPRA requirements. Where applicable, we will adopt performance measures identified the DOI Strategic Plan and Service Operational Plan for use in our Plan.

This Plan establishes the goals, objectives, and strategies that will guide our work efforts over the next five years. The Plan is a living document and will be reviewed annually. Strategies may change as milestones are reached or as unforeseen circumstances or new opportunities arise; however, the overall goals and objectives are expected to remain stable throughout the planning cycle.

At the beginning of each fiscal year we will use the Plan, in conjunction with regional and national work activity guidance, to develop an Annual Work Plan for the office. We also hope that this Plan will influence the development of regional and national work activity guidance. The Annual Work Plan will identify the specific strategies and projects to be emphasized for the coming year, the tasks to be completed relative to those projects, and will assign lead responsibilities for those tasks.

GOAL 1. Through a Strategic Habitat Conservation approach, recover populations of federally listed species (endangered, threatened and critical habitat) and conserve at risk species (as listed in the NC Natural Heritage Program documents referenced below) such that their listing is unnecessary in the North Carolina Piedmont, Sandhills and Coastal Plain.

Maintaining biological diversity is essential to restoring and sustaining healthy ecosystems, which are in turn essential to our own survival and quality of life. The welfare of the rarest members of an ecosystem is an important indicator of its overall health, and increased rates of extinction and species decline are important signals of environmental stress and degradation. The Endangered Species Act (ESA) was enacted in recognition of the increasing role of humans in the loss of biodiversity and the importance of conserving rare species to a healthy human environment. As such, the conservation of rare species is a fundamental component of our mission. There are 33 federally listed species in the RFO work area, and many at-risk species (Table 1). Because we view increases in the number of species at risk of extinction as a symptom of ecosystem degradation, the RFO works throughout the Piedmont, Sandhills and Coastal Plain of North Carolina to protect at-risk and other rare species by conserving the ecosystems upon they depend. While the authority and tools afforded through the ESA form the core of our efforts to protect rare species and their habitats, the RFO brings the full range of our capabilities to bear on these issues, and actively involves a broad array of partners and stakeholders. The objectives under this goal are designed to use appropriate provisions of the ESA and other applicable laws and our staff's expertise, in cooperation with our partners, to advance our goal of ultimately recovering populations of listed species in the RFO work area and to implement landscape-scale protection and management actions to prevent at-risk species from being listed.

The desired future condition relative to this goal would be that all federally listed species are meeting the recovery criteria identified in their respective recovery plans within the RFO work area. Further, there would be no species identified as candidates for federal listing based on their status within the RFO work area.

Achieving the above-identified desired future condition is well beyond the scope of this five-year plan. As such, for the purposes of this five-year plan we have narrowed our focus relative to listed and at-risk species to three specific areas: 1) listed species under imminent threat of extinction (or extirpation from our work area); 2) listed species for which recovery is achievable in the near term; 3) at-risk species for which conservation actions in the near term could make federal listing unnecessary. For species in these categories we have identified the following intermediate goals, which we believe are achievable within the timeframe of this plan.

- 1) Ensure that the Tar River spinymussel is not under imminent threat of extinction;
- 2) Meet the recovery criteria for down-listing of the Cape Fear shiner in at least the Rocky and Deep Rivers;
- 3) Meet the recovery criteria for delisting of golden sedge;
- 4) Achieve continued population growth in the Coastal NC Primary Core population of RCW such that there are at least 40 potential breeding groups by 2017;
- 5) Implement conservation actions that lessen the need to list the magnificent ramshorn.

The Raleigh Field Office has identified the following objectives related to federally protected and at-risk species based on our legal responsibilities, the degree of rarity and geographic range of the species, and the expertise and strengths of our staff and our partners. The following objectives and strategies reflect our SHC approach for achieving the above intermediate goals over the next five years. The objectives are arranged in order of relative priority.

Objective 1.1: Promote the recovery of **listed species endemic** to the Raleigh Field Office work area by working with our partners to implement all elements of Strategic Habitat Conservation.

For the Cape Fear shiner, Tar River spinymussel, Saint Francis satyr, and golden sedge the RFO will:

Strategy 1.1.1: Lead our partners in *biological planning* for the species by collecting and/or compiling scientific knowledge about the species biology and habitat requirements, and management of its habitat.

Strategy 1.1.2: Take a lead role in developing an appropriate scale *conservation* design for the species by determining which populations and their supporting habitat are important to the survival of the species.

Strategy 1.1.3: Facilitate *conservation delivery* for the species by implementing on-the-ground management actions through our Partners for Fish and Wildlife and Coastal Programs and other partner's programs with the goal of efficiently affecting populations.

Strategy 1.1.4: Direct *assumption-driven research* by evaluating and refining biological planning assumptions.

Strategy 1.1.5: Guide outcome-based monitoring to assess the effects of management on habitats and individuals in order to influence future management decisions.

Objective 1.2: Conduct appropriate planning and initiate conservation actions for **priority non-listed endemic species** in the RFO work area by working with partners through Strategic Habitat Conservation.

For the Neuse River waterdog, Carolina madtom, Magnifiscent ramshorn, and Lampsilis sp. the RFO will:

Strategy 1.2.1: Lead biological planning for these species by collecting and/or compiling scientific knowledge about the species biology and habitat requirements, and management of its habitat.

Strategy 1.2.2: Take a lead role in developing an appropriate scale *conservation* design for the species by determining which populations and their supporting habitat are important to the survival of the species.

Strategy 1.2.3: Facilitate *conservation delivery* for the species by implementing on-the-ground management actions through our Partners for Fish and Wildlife, Coastal, Candidate Conservation and other programs with the goal of positively affecting populations in order that federal listing may be avoided.

Strategy 1.2.4: Direct *assumption-driven research* by evaluating and refining biological planning assumptions.

Strategy 1.2.5: Guide outcome-based monitoring to assess the effects of management on habitats and individuals in order to influence future management decisions.

Objective 1.3: Contribute to the recovery of **listed species having a broad geographic** range (extending beyond the RFO work area, but with significant populations within the RFO work area) by working with partners to recover populations in the RFO work area by implementing all the elements of Strategic Habitat Conservation.

For the dwarf wedgemussel, Roanoke logperch, James River spinymussel, shortnose sturgeon\*, red-cockaded woodpecker, Bermuda petrel\*, Michaux's sumac, smooth coneflower, seabeach amaranth, Cooley's meadowrue and rough-leaf loosestrife the RFO will:

Strategy 1.3.1: Contribute to *biological planning* done by species' lead biologists by providing scientific knowledge about a species and its habitat requirements within the RFO work area.

Strategy 1.3.2: Participate in developing and implementing a spatially-explicit *conservation design* for the species by prioritizing the selection and protection of management areas in the RFO work area.

Strategy 1.3.2: Collaborate with our partners to implement on-the-ground conservation delivery by promoting priority management activities within specific landscapes throughout the RFO work area such that the recovery criteria for these species will ultimately be met within the RFO work area.

Strategy 1.3.4: Provide technical assistance to identify *assumption-driven* research questions/needs/gaps that must be addressed to refine biological planning assumptions relevant to the RFO work area.

Strategy 1.3.5: Further *outcome-based monitoring* by commenting on the effects

of applied management actions on habitats and species in order to influence future management decisions within the RFO work area.

Objective 1.4: Support the recovery of **other listed species having a broad geographic** 

range (with populations or habitats in the RFO that do not significantly contribute to recovery) by working with our partners to implement

conservation delivery.

For the piping plover, West Indian manatee, sensitive joint vetch, loggerhead sea turtle, green sea turtle, leatherback sea turtle, Kemp's Ridley sea turtle, and hawksbill turtle the RFO will:

Strategy 1.4.1: Manage Section 7 (of the Endangered Species Act)

responsibilities.

Objective 1.5: Work with others to conserve **at-risk species** and their habitats such that

their listing is unnecessary (RFO focal at-risk species will be guided by priority at-risk species listed in the NC Natural Heritage Program and NC

Wildlife Resources Commission documents referenced below).

Strategy 1.5.1: Participate in councils, committees, and professional societies

tracking the status and trends of at risk species in North Carolina.

Strategy 1.5.2: Maintain and enhance staff expertise and proficiency in ecology of

taxa of conservation concern (plants, freshwater fish and invertebrates, terrestrial invertebrates, birds, reptiles and amphibians) to support biological planning and conservation

design actions at landscape scales.

Strategy 1.5.3: Be receptive to considering conservation delivery opportunities for

at risk species, especially those that leverage partnerships advancing our priority species and habitat objectives (goal 1,

objectives 1, 2, and 3 above).

### Goal 2: Conserve and manage migratory birds with an emphasis on declining species in the North Carolina Piedmont, Sandhills, and Coastal Plain.

Migratory birds are federal trust species which we have been charged to conserve and manage. Migratory birds comprise many different guilds, have varying needs, use myriad habitat types, and are faced with an array of threats and a variety of limiting factors. For example, strategies to manage loggerhead shrikes and Wilson's plovers have very little in common yet both are migratory birds which we are charged to conserve and manage. To further complicate matters, conservation of some species is accomplished to the exclusion of others because of their contrasting needs. The Service has an entire division devoted to migratory birds. The National Wildlife Refuge System also has goals for migratory birds. Most North Carolina refuges were established for the conservation of migratory birds, namely waterfowl and other birds. It is important for Ecological Services to support the migratory bird offices, refuges, and law enforcement in addressing the conservation needs of migratory birds.

The RFO will work cooperatively with these other divisions as well as our outside partners to take actions to maintain sustainable populations of migratory birds. Comprehensive plans have been developed for specific bird guilds and habitat types. Those plans include the North American Waterfowl Management Plan, U.S. Shorebird Conservation Plan, North American Waterbird Conservation Plan, and North American Landbird Conservation Plan. There are also opportunities to collaborate on conservation strategies through the North American Bird Conservation Initiative (NABCI) and North Carolina Partners in Flight (NC-PIF). The NABCI is an unprecedented effort to align the conservation community and society at large in the task of conserving this continent's bird life. The NC-PIF is a more localized cooperative effort to further bird conservation by involving government agencies, conservation organizations, private industry, the academic community, and citizens. The primary focus of NC-PIF is to coordinate and promote education, habitat conservation, and research efforts among its partners. The NC-PIF has developed a "North Carolina Bird Species Assessment" describing bird species that are in greatest need of conservation and management in North Carolina and the habitats and geographic regions that they use (Appendix A). This assessment provides an excellent reference to help the RFO focus on a subset of those species that are in the most need for conservation attention by conserving and managing their habitats within selected priority areas. Overall, the biggest threat to those declining species identified by NC-PIF is loss of habitat due to conversion, habitat fragmentation, or the lack of habitat management on private lands. While the RFO will continuously work with others to achieve benefits to migratory birds, we expect to benefit migratory birds in the next five years by the following specific habitat restoration/enhancement actions:

1) The RFO will support longleaf pine restoration as described in the America's Longleaf Initiative by continuing to play a leadership role in the NC Longleaf Coalition and the NC Prescribed Fire Council. Through Partners for Fish and Wildlife, Safe Harbor, and RCW recovery actions, the RFO will also provide technical and financial assistance for on-the-ground longleaf pine restoration projects. In the next five years we expect to restore 3,000 acres of longleaf pine habitat across the Greater Uwharrie, Sandhills, Cape Fear Arch, and Onslow Bight landscapes for the benefit of species such as Bachman's sparrow, brown-headed nuthatch, and pine warbler.

- 2) The RFO will continue to participate in the Corp of Engineers' John H. Kerr 216 study to reduce the impacts of their flood control operations upon the Roanoke River's floodplain, of which over 99,000 acres are in conservation ownership, including over 20,000 acres which make up the Roanoke River National Wildlife Refuge. Migratory birds such as Cerulean warblers, Swainson's warblers and American black ducks will benefit from a decrease in frequency and duration of flooding during the growing season.
- 3) The RFO will help establish a review board consisting of representatives from state and federal agencies, the private sector, non-governmental organizations, and universities to govern the Atlantic White Cedar (AWC) Initiative's efforts. This effort will disseminate information in educational outreach, promote commercial utilization of AWC, encourage AWC research, identify and promote AWC BMPs, and encourage restoration of AWC to its historic range. Restoration of AWC will benefit migratory bird species such as black-throated-green warbler, Swainson's warbler, and hooded warbler.
- 4) The RFO will continue to support peatland restoration on refuges by providing 1) technical and financial assistance to priority restoration actions identified by peatland refuges, and 2) technical expertise on the science of peatland carbon sequestration as a tool to expand partnerships and resources to implement priority restoration needs. Within five years we anticipate restoring a minimum of 500 acres of drained peatlands annually (2500 acres total) on NWR (Pocosin Lakes, Alligator River, and Great Dismal Swamp NWRs) and other conservation lands for the benefit of priority migratory bird species including red-cockaded woodpecker, black-throated green warbler, and Swainson's warbler.

The RFO has identified the following objectives for migratory birds based on our legal responsibilities, the resources and opportunities available to us, and the expertise and strengths of our staff and partners. The following strategies reflect our Strategic Habitat Conservation approach for achieving these priority objectives over the next five years.

Objective 2.1: (Biological Planning) Although lists of priority species currently exist, we will assist others in further refining a list of focus species and/or guilds and their habitats in order to better target our efforts to help arrest declining population trends of these species within the lower Piedmont, Sandhills, and Coastal Plain of NC.

Strategy 2.1.1: Work with the Service's Migratory Bird Division, North Carolina Wildlife Resources Commission, Partners in Flight, South Atlantic LCC, ENC/SEVA Team and others to identify a subset of migratory bird species and/or guilds which could be measurably benefitted by the actions of the RFO.

Strategy 2.1.2: Review relevant data (to include modeling data) to determine current population trends of indicator/surrogate species/guilds and assist in identifying limiting factors and threats to the species within the RFO work area.

Strategy 2.1.3: Within the RFO's scope and ability, identify management and conservation actions to address declining population trends of focus species/guilds.

Objective 2.2: (Conservation Design) While applying existing modeling data to spatial data, utilize decision support tools (currently being developed by the Designing Sustainable Landscapes Project of the SALCC and Atlantic Coast Joint Venture for 43 species of migratory birds and their associated habitats) to help determine priority management/conservation areas for focus species/guilds, and assist in determining a coarse estimate of amount of habitat to be managed, conserved, restored, enhanced, or created.

Strategy 2.2.1: Establish a short-term RFO Migratory Bird Conservation Design Team to address strategies of Objective 2.2.

Strategy 2.2.2: Using available information and input from our governmental and nongovernmental partners, select priority management/ conservation areas of which the RFO has effective means to help arrest the decline of focus species/guilds.

Strategy 2.2.3: In collaboration with our partners, use available information to help determine the relevant baseline habitat conditions of the priority management/conservation areas and identify deficiencies contributing to the decline of the focus species/guilds.

Strategy 2.2.4: Formulate quantitative and qualitative habitat objectives for priority areas.

Strategy 2.2.5: Incorporate climate change effects (stressors) into conservation design analyses for near-term impacts (e.g. sea-level rise) and more long-term impacts (e.g. rising temperature) to create more robust decision support tools.

Strategy 2.2.6: Develop a map of priority management/conservation areas to be used by all RFO staff.

Objective 2.3: (*Conservation Delivery*) Working with governmental and nongovernmental entities, manage, restore, enhance, create and conserve important habitat within selected priority areas to arrest the decline of the selected focus species/guilds.

Strategy 2.3.1: Provide targeted technical and financial assistance to landowners, State partners and others to manage, restore, enhance, create and conserve important habitat within selected priority areas.

Strategy 2.3.2: Use Safe Harbor agreements and Farm Bill conservation programs to manage, restore, enhance, create and conserve important habitat within selected priority areas.

Strategy 2.3.3: Engage the ENC/SEVA Team, South Atlantic LCC, and other partnerships to identify opportunities to leverage efforts on a larger scale to manage, restore, enhance, create and conserve important habitat within selected priority areas.

Strategy 2.3.4: Work with land trusts, the State, The Nature Conservancy, and others to identify and permanently protect (either by conservation easement or acquisition) important habitat within selected priority areas.

Strategy 2.3.5: While reviewing development projects early in the project planning process, identify projects that have the potential to significantly impact focus species and offer/negotiate recommendations which will avoid, minimize, and mitigate impacts.

Strategy 2.3.6: For non-focus species of migratory birds in or outside of priority areas, opportunistically provide technical and financial assistance and recommendations which will benefit migratory birds.

Strategy 2.3.7: When feasible, align priority migratory bird conservation delivery efforts with priority migratory bird conservation actions contained within the North Carolina Wildlife Action Plan.

Objective 2.4: (Assumption-driven Research) Since the RFO has limited ability to directly conduct research, it will rely upon existing research data and work with researchers to direct future research to provide data and recommendations to help arrest the decline of the focus species within priority areas.

Strategy 2.4.1: Using existing research and monitoring data, make appropriate assumptions regarding selection of focus species, priority areas, necessary management/conservation actions, and the extent of those actions needed to arrest the decline of migratory birds.

Strategy 2.4.2: In concert with our partners, engage research institutions and potential funding sources to direct research which will benefit focus species within priority areas.

- Objective 2.5: (Outcome-based Monitoring) Because the RFO has limited ability to conduct population monitoring, the RFO will utilize future monitoring data acquired by others and recommend future targeted data collection. Given this dependence upon others for data, there may be a significant time lag in assessing accomplishments in arresting the decline of focus species.
  - Strategy 2.5.1: In units of acres affected, determine RFO accomplishments.
  - Strategy 2.5.2: In units of technical assistance or recommendations made, determine RFO accomplishments.
  - Strategy 2.5.3: In qualitative terms, determine landscape level accomplishments made through partnerships.
  - Strategy 2.5.4: Use monitoring data of population trends of focus species within priority areas, and when compared to baseline conditions, help determine if accomplishments have contributed net progress towards arresting the decline of focus species.
  - Strategy 2.5.5: Identify gaps in monitoring data and seek to fill those gaps.
  - Strategy 2.5.6: If monitoring data demonstrates that current RFO conservation delivery efforts have not contributed net progress towards arresting the decline of focus species, then the RFO will reevaluate all strategies.

### Goal 3: Restore migratory and diadromous fish population abundance and range and restore and protect the aquatic habitats on which they depend in North Carolina.

Southeastern river systems have been dramatically modified from historic conditions through the alterations of stream flows, changes in water quality, and the construction of dams along critical migratory routes. These modifications have altered aquatic biodiversity and fisheries resources of North Carolina's rivers. In addressing these and other factors affecting migratory fishery resources, we will work closely with our federal, state and private partners to implement relevant programs related to improving habitat quality and quantity. Our objectives defined below complement those identified in the Service's Southeast Region Fisheries Plan, Aquatic Resources Strategic Plan, the Service's National Fish Passage Program, Southeast Aquatic Resource Partnership, and the State/Federal Albemarle-Pamlico Comprehensive Conservation and Management Plan. With respect to migratory fish, our specific mandate is to protect and restore diadromous fisheries in North Carolina, which include American shad, hickory shad, blueback herring, alewife, striped bass, Atlantic sturgeon, shortnose sturgeon, and American eel. Nearly all of these fish species provide commercial and recreational economic benefits. Other migratory fish include native riverine fishes that have become reduced in abundance and range. Our goal for these species is to restore their abundance and range and improve habitat to increase carrying capacity.

Within the next five years the following actions are expected:

- 1) Removal of Milburnie Dam;
- 2) Measurable progress on the implementation of Yadkin Pee Dee Fish Restoration Plan;
- 3) Completion of fish passage weir at Cape Fear River Lock and Dam #1, and contribute to planning for and implementation of passage on Lock and Dam 2 and 3;
- 4) Stocking of at least 4 million American shad in the Roanoke River, providing passage via trap and transport from Roanoke Rapids Dam to above Kerr Dam when populations are sufficient to do such and providing American eel passage at Gaston Dam when populations warrant such.
- Objective 3.1: (*Biological Planning*) Prioritize habitat and management barriers to increase diadromous fish stocks.
  - Strategy 3.1.1: Dams that block diadromous fish from historically important spawning sites sometimes have endangered mussels and fish in the river system. Planning will ensure no adverse impacts occur to those resources and will aim at achieving a positive effect.
  - Strategy 3.1.2: Identify areas with water quality problems affecting migratory fish (especially in regards to dissolved oxygen deficiencies).

Strategy 3.1.3: Identify water flow problems affecting migratory fish (particularly timing, magnitude, and duration of regulated flows).

Objective 3.2: (*Conservation Design*) Develop a clear pathway for restoration of diadromous fish population to historic levels.

Strategy 3.2.1: Work with partners to identify and prioritize removal of barriers to historic spawning and rearing habitat.

Strategy 3.2.2: Develop restoration projects with state, federal, non-profit, public partners.

Objective 3.3: (*Conservation Delivery*) Implement identified pathways to restore diadromous fish populations, and enhance rare species that share the same habitat.

Strategy 3.3.1: Provide funding for and technical assistance to remove dams, build and repair fish passage structures.

Strategy 3.3.2: Restore, conserve and protect in-stream, riparian buffers and riverine wetland habitats.

Strategy 3.3.3: Encourage management of water flows and quality necessary for life prerequisites for diadromous fish populations and rare aquatic species that share the same habitat.

Strategy 3.3.4: Work with FWS Division of Fisheries and Sport Fish Restoration, NC Wildlife Resources Division, NC Division of Marine Fisheries, National Marine Fisheries Service, Atlantic States Marine Fisheries Commission, and non-governmental organizations to accomplish any stocking (augmentation, reintroduction) required and to insure any proposed new dams are required to have fish passage.

Objective 3.4: (Assumption-Driven Research) Support aquatic research to test techniques and suggest improvements.

Strategy 3.4.1: Use cooperative agreements and grant authority to accomplish research thru USGS, NC State University, Duke University, East Carolina University, University of North Carolina at Chapel Hill and other universities as appropriate.

Strategy 3.4.2: Support migratory fish monitoring efforts such as tagging efforts by state agencies, cooperative winter cruises, and others.

Strategy 3.4.3: To insure that dam removals intended to benefit migratory fish do not harm endangered mussel and non-migratory fish communities support research aimed at further elucidating the relationship between dam removal and endangered mussel and non-migratory endangered fish and amphibians.

Objective 3.5: (*Outcome-based Monitoring*) Monitor the effectiveness of conservation delivery efforts.

Strategy 3.5.1: Use State recreational and commercial fishery status reports from the NC Division of Marine Fisheries and NC Wildlife Resources Commission to gauge improvements in migratory fish populations as a result of conservation delivery in this goal.

Strategy 3.5.2: Use Museum, Natural Heritage and Section 6 reports to document recolonization of historical habitat by rare aquatic species as a consequence of the conservation delivery in this goal.

Strategy 3.5.3: Consult with the Atlantic States Marine Fisheries Commission and the South Atlantic Fisheries Management Council to see how the NC portion of their mission is augmented by the conservation delivery in this goal.

Objective 3.6: Conduct public outreach on conservation delivery and outcomes.

Strategy 3.6.1: Work with and support programs such as Shad in the Schools Program lead by the NC Museum of Natural History.

Strategy 3.6.2: Distribute public outreach material including fact sheets, video and reports by making them available on the internet.

Strategy 3.6.3: Encourage publication of assumption driven research relating to this goal in the peer reviewed scientific literature.

Objective 3.7: Consider and as appropriate address the effects of climate change on fish habitat restoration efforts.

Strategy 3.7.1: Assess the degree to which dam removal and fish passage allow fish to better acclimate to climate change by allowing migration between habitat types from the sea to inland habitats.

Strategy 3.7.2: Assess the degree to which conservation delivery targets such as restoring and improving habitat and population strength allow greater species resilience (healthy populations are better equipped to handle the stress of climate change)

Strategy 3.7.3: Assess the degree to which water flows are affected by climate change and the effects of any such effects on aquatic resources.

## **Goal 4:** Support and assist each of the North Carolina National Wildlife Refuges in their mission to conserve and protect fish and wildlife resources.

Eastern North Carolina's 11 National Wildlife Refuges are managed by the Service for wildlife and wildlife-dependent recreation and education. While each refuge has its own professional staff, the RFO both shares in the public trust responsibilities for these refuges and values their role in contributing to our other goals of migratory bird, diadromous fish, and endangered and threatened species conservation. With approximately 400,000 acres under Service stewardship in eastern North Carolina, National Wildlife Refuges are anchors for biodiversity and landscape level conservation. These areas have value now, and they will become more critical for wildlife, fish, plants, and people as eastern North Carolina is increasingly developed. As such, refuges will be a focus of our work in the RFO. Our commitment to refuges is an embodiment of the "One Service" priority of the Southeast Regional Director, an acknowledgement of our role in helping achieve the visions for refuges as provided in the *National Wildlife Refuge System Improvement Act of 1997* and the 1999 *Fulfilling the Promises* report, and recognition of the value of these places to achieving our office's Vision.

The objectives under this goal are designed to ensure that we meet our stewardship responsibilities on refuge lands and waters and take advantage of the conservation benefits they provide. Through implementation of these objectives we will proactively maintain water quality and enhance land protection on and around refuges. The objectives are designed to enable us to be responsive to the technical assistance needs of refuge staff, proactive in addressing actions with the potential to negatively affect refuge resources and the public's use of those resources, and cognizant of opportunities to enhance cooperation. A Comprehensive Conservation Plan (CCP) exists for each refuge, and each includes goals related to *Wildlife, Fish, and Plant Populations; Habitat Management; Public Use; Resource Protection;* and, *Administration*. Because each refuge has its own vision, goals, management objectives and strategies within the CCPs, the actions outlined below are intended to be broad enough to encompass the 11 refuges collectively. Where specific refuge projects we are involved with are known they are listed, and annual work activity guidance will expand on refuge-specific work.

- Objective 4.1: Assist Refuges in meeting their *biological planning* needs so that Service lands are fully functioning components of the broader conservation landscape.
- Objective 4.2: Assist Refuges in meeting their *conservation design* needs to ensure that priority conservation actions on and around Service lands are appropriately identified and coordinated.
- Objective 4.3: Lead implementation of identified *conservation delivery* strategies when it is appropriate for Ecological Services to do so, and assist Refuges and our partners in other conservation delivery actions to benefit Service lands.

- Objective 4.4: Assist Service land managers in the development and implementation of *results-oriented monitoring* activities where appropriate given the unique capabilities of the Raleigh FO.
- Objective 4.5: Assist Service land managers and partners in the development and implementation of *assumption-driven research* to address priority information needs related to stewardship of Service lands.

### References

Buchanan, M. F. and J. T. Finnegan. <u>2010 Natural Heritage Program List of the Rare Plant Species of North Carolina</u>. NC Natural Heritage Program, Raleigh, NC.

LeGrand, H. E., Jr., J. T. Finnegan, S. E. McRae, and S. P. Hall. <u>2010 Natural Heritage Program List of the Rare Animal Species of North Carolina</u>. NC Natural Heritage Program, Raleigh, NC.

North Carolina Wildlife Resources Commission. 2005. *North Carolina Wildlife Action Plan*. Raleigh, NC.